DOCUMENT RESUME

ED 110 438 95 SP 009 428

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TITLE Collaborative Relationships on Teaching Teams: Implications for Collegial Influence, Team Morale, and Instructional Practices. Technical Report No. 45.
INSTITUTION Stanford Univ., Calif. Stanford Center for Research and Development in Teaching.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.
PUB DATE Aug 75
CONTRACT NE-C-00-3-0062
NOTE 44p.

EDRS PRICE MF-$0.76 HC-$1.95 PLUS POSTAGE
DESCRIPTORS Flexible Schedules; Interpersonal Relationship; Open Plan Schools; *Peer Relationship; Self Contained Classrooms; *Teacher Morale; *Teaching Procedures; *Team Teaching; *Teamwork

ABSTRACT

This study looks at the ways team teaching members work together, at their interdependencies, divisions of labor, and modes of coordination. It is a microorganizational study of teaching teams that looks both at factors which predict or explain how a team is organized and at the implications of these patterns of organization for (a) collegial influence, (b) team morale, and (c) instructional practices. The sample consisted of 46 teams in both open space and self contained settings, and variables were measured using questionnaire items. Most of the analysis used team level data. A series of regression analyses were used and attention was directed to whether relevant paths had positive, negative, or near-zero coefficients. Collegial influence was found to be associated with open space and the extent of common policies or agreements made by the team members. Team morale was related positively to (a) the rate of communication, (b) the extent of common policies, and (c) the team's autonomy from external supervision, and negatively to the amount of cross-grouping used by the team. The instructional practices used by teachers were found to be related to open space, teaming, and the degree of interdependence among team members. Results indicated that autonomy, flexibility, and voluntarism were likely to produce the most successful collaborative relationships. An appendix is attached which contains the indicators of key variables and intercorrelations of scale items. (Author/RC)

ED110438

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Technical Report No. 45

COLLABORATIVE RELATIONSHIPS ON TEACHING TEAMS: IMPLICATIONS FOR COLLEGIAL INFLUENCE, TEAM MORALE, AND INSTRUCTIONAL PRACTICES

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August 1975

Published by the Stanford Center for Research and Development in Teaching, supported in part as a research and development center by funds from the National Institute of Education, U. S. Department of Health, Education, and Welfare. The opinions expressed in this publication do not necessarily reflect the position, policy, or endorsement of the National Institute of Education. (Contract No. NE-C-00-3-0062.)

SP009 438

INTRODUCTORY STATEMENT

The Center's mission is to improve teaching in American schools. Its work is carried out through three research and development programs--Teaching Effectiveness, the Environment for Teaching, and Teaching and Linguistic Pluralism--and a technical assistance program, the Stanford Urban/Rural Leadership Training Institute. A program of Exploratory and Related Studies includes smaller studies not included in the major programs. The ERIC Clearinghouse on Information Resources is also a part of the Center.

This report is the latest result of a long line of research on team teaching and open space schools conducted within the Environment for Teaching Program.

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COLLABORATIVE RELATIONSHIPS ON TEACHING TEAMS: IMPLICATIONS FOR COLLEGIAL INFLUENCE, TEAM MORALE, AND INSTRUCTIONAL PRACTICES

Eric Bredo

I. INTRODUCTION

The recent adoption of team teaching and open space architecture has resulted in the possibility of a substantial change in the pattern of elementary school organization. Rather than working in a "lonely" and "isolated" fashion, as some observers have characterized it (Lortie, 1964; Knoblock and Goldstein, 1971), teachers in these new settings are interacting and working together more closely. Instead of working in parallel, with little division of labor beyond age-grading, teamed teachers are, in some cases, developing considerably more complex divisions of labor. These changes raise interesting questions both for the sociologist of education and for the educational practitioner. For instance, how do teachers on teams actually work together? What are the implications of these new work arrangements for collegial relationships? And what are their implications for supporting new instructional practices?

Research on team teaching has suggested that teaming may significantly affect collegial evaluation and influence processes, as well as teachers' morale. Studies by Pellegrin (1970) and Meyer and Cohen et al. (1971) found that teachers on teams interacted more frequently, evaluated each other more often, and reported greater job satisfaction than those working alone. The mechanisms that produce these changes, however, are still unclear. For one thing, these studies considered all teaching teams to be alike and did not take into account the variety of ways members can work

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This report is drawn from the author's doctoral dissertation, "Collaborative Relationships on Teaching Teams," Stanford University, 1975. An earlier version was presented at the Annual Meeting of the American Educational Research Association, Washington, D.C., March 30 - April 3, 1975.

together. They have been criticized for failing to consider differences among teams in task interdependence (Packard et al., 1973). Thus, it is not clear to what extent and in what ways teachers on teams actually work together any differently than those not on teams,or what impact these variations in teaming practices might have.

Recently, organization theorists have given considerable attention to the tasks and technologies utilized in organizations, and to the implicati of different technologies for the roles of organization members. While there has been considerable disagreement over how best to characterize tasks and technologies, much of the discussion has revolved around the concepts of task uncertainty and task interdependence (March and Simon, 1958; Thompson, 1967; Mohr, 1971). It has been argued that these characteristics of the task system may affect coordination (Thompson, 1967; Perrow, 1970), participation (Hage and Aiken, 1969), and power (Hickson et al., 1971). In a summary comment on the applicability of this work to education, Charters suggests that:

> Much of the discussion of the school's technology, like that of other people-serving organizations, emphasizes the fundamental uncertainty of the technical processes of work....We take this for granted. But we find it a universal condition of educational institutions, hence not especially useful as an analytical tool for distinguishing among educational institutions. If organization theory is to make a contribution to educational affairs, it must provide fine-grained concepts and measures capturing significant variations from one school to the next, not just concepts that contrast schools with automobile assembly plants. The idea of task interdependence among teaching personnel appears to serve this finely differentiating purpose (Charters, 1975).

The present study takes this suggestion to heart and takes a close look at the degree of interdependence among team members, as well as considering the modes of coordination they use. It thus attempts to apply recent thinking on organizations to teaching teams.

After describing the approach, the sample, and the methodology, the study looks at the contexts within which teams operate. Some teams are in open space areas, others in self-contained areas; some operate relatively autonomously, others under close administrative supervision; some teams are

relatively large, others small. The effects of these contextual variables on interdependence and the modes of coordination used by teams are explored in section IV. The study then considers what further effects interdependence and the modes of coordination may have on influence relations among teachers and on team morale. These questions are explored in sections V and VI. Section VII takes an exploratory look at some of the implications of teaming and open space architecture for instructional practices. The final section considers what the study suggests about the general nature of teaching teams and the practical implications of the study for improving teaming.

II. APPROACH

The study attempts to build on previous research by (1) paying close attention to the context in which teams operate, and (2) focusing in more detail on the work organization of the team, that is, on the ways team members work together and coordinate their work.

Three sets of variables will be considered and related to one another. The first set describes the team's setting or context. Included here are the type of classroom setting (open space or self-contained),[1] the team's autonomy from external supervision, and the size of the team.[2] It is assumed that these contextual variables may affect a second set of variables, the intervening variables, which describe the way team members work together and coordinate their activities. Finally, it is assumed that all of these variables may affect the dependent variables: collegial influence, team morale, and instructional practices. The causal ordering which is assumed is shown in Figure 1.[3]

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[1]"Open space" or "open plan" architecture features several teachers teaching in a large area or "pod," rather than in walled off, self-contained classrooms.

[2]While team size might not be considered a contextual variable, it seems defensible as an exogenous variable which "structures" some of the processes occurring on teams.

[3]A simple recursive model, which has no reciprocal causation or causal loops, is assumed here.

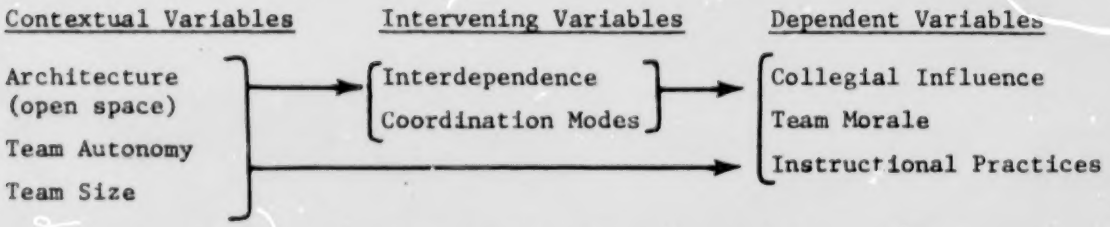

Fig. 1. Assumed causal order among variables.

Given this overall causal order, the study seeks to determine the directions of the relationships (positive or negative), as well as which relationships are effectively absent. Thus the study is not a strict hypothesis-testing study, and no attempt will be made to suggest that post hoc findings were actually prior hypotheses. Nonetheless, some informal hypotheses will be proposed for purposes of guiding and simplifying the discussion.

In conceptualizing interdependence among team members, it is necessary to consider the different ways that teachers might work together. First, they can work alone, where the only function of the team is to share ideas or materials. Second, they can work together with a fixed division of labor. In this case they exchange pupils, and are thus somewhat interdependent, but they still work separately. As an example, they may specialize by subject matter, one teaching reading and another math, or one may take the less advanced and another the more advanced students. In either case they work with a division of labor with respect to the students they instruct. A final way teachers may work together is to work jointly without a set division of labor. In this case teachers actually teach the same group of students the same subject, a task necessarily involving greater interdependence and more personal coordination. Thus these three ways of working together represent generally increasing levels of interdependence. However, this picture is complicated to some degree since they may use a mixture of these procedures: they may work alone in one subject, divide the labor in another, and work jointly in a third. These complexities are taken into account in the way work arrangements are measured in the study.

Teams may coordinate their activities in three main ways: by (1) programmed coordination, (2) lateral communication, or (3) hierarchical coordination (March and Simon, 1958; Lindblom, 1965).[4] Programmed coordination refers to impersonal coordination mechanisms such as rules, policies, or plans. Lateral communication is direct, personal coordination between actors, where power or status differences do not play a major role. Finally, hierarchical coordination is personal coordination by a more powerful or higher status actor. These modes of coordination are not seen as directly related to the three ways teachers may work together. Rather relationship to the way teachers work together or divide the labor is an empirical question to be explored in the study.

III. SAMPLE AND METHODOLOGY

The data for this study come from questionnaire responses from all of the teachers in a sample of 16 San Francisco Bay Area elementary schools. These schools were selected on the basis of their principals' responses to have as great variety as possible in collaborative arrangements and architectural styles. Included in this sample were 46 self-proclaimed teaching teams, which constituted the principal sample for this study.

Table 1 shows the distribution of teachers on teams and in differing types of classroom spaces. There were approximately equal numbers of teamed teachers in open space and in self-contained areas. However, very few non-teamed teachers were in open space areas.

Most of the teams in this sample were very small, about half of them being composed of only two teachers (see Table 2). This distribution contrasts with that of some other studies, undoubtedly because other studies specially selected the teams they wanted to study, rather than taking all of the teams that existed in a given set of schools.

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[4] A fourth method, selecting members with similar prior socialization, is not considered here.

TABLE 1

Distribution of Teachers by Teaming and Classroom Architecture

	Open Space	Self-Contained
On Team	52 (23%)	50 (22%)
Not on Team	5 (2%)	119 (53%)

N = 226

TABLE 2

Distribution of Teams by Size

Size of Team	Number of Teams	Percent of Total
2	22	49%
3	14	29
4	5	11
5	3	7
6	1	2
7	1	2
Total	46	100%

TABLE 3

Distribution of Teams by Type of Leadership

Type of Leadership	Number of Teams	Percent of Total
No Leader	40	86%
Informal Leader	5	11
Formal Leader	1	2

The teams were also largely equal-status teams, i.e. they had no leader, as shown in Table 3. In fact, only one team in the sample reported having a formal leader. If these self-reports are valid, it is clear that there were few "vertical-bureaucratic" teams (to use Lortie's term) in this sample, and that most of the teams more nearly fit a "horizontal-collegial" model.

Indicators of Variables

All of the variables in the study were measured using questionnaire items, many of them of a Likert-type. The indicators for the variables in the study are shown below.

Contextual Variables	Indicators
Open Space	Type of classroom space: (a) self-contained, (b) partitions - usually closed, (c) partitions - usually open, (d) open space.
Team Autonomy	Frequency with which principal sits in on team meetings.
Team Size	Reported number of teachers on team.
Intervening Variables	
Interdependence	Frequency of cross-grouping and joint teaching in each of three subjects: math, reading, and social studies.[5]
Team Policies	Extent of explicit team policies.[6]
Lateral Communication	Frequency of regular or impromptu meetings.[7]
Hierarchical Coordination	Difference in influence attributed to self and other team members or team leader in determining the content of team meetings.[8]

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[5]Scale from "once a day" (5) to "less than once a month" (2) to "never" (0).

[6]Scale from "a great deal" (5) to "none" (1).

[7]Scale from "several times a day" (5) to "less than once a month" (1).

[8]Scale from "very influential" (5) to "not at all satisfied" (1).

Dependent Variables

Collegial Influence	Reported influence of other members of the team on one's own (a) instructional methods, (b) lesson content and materials, (c) standards of student discipline, (d) schedule of lessons and activities.[9]
Team Morale	Satisfaction with team in four areas: (a) extent of sharing of resources, (b) openness in commenting on each other's teaching, (c) ability to plan together effectively, (d) flexibility in scheduling classes and activities.[10]
Instructional Practices	(a) Classroom grouping practices.[11] (b) Variation in instructional materials.[12] (c) Frequency of change in membership of instructional groups.[13] (d) Student autonomy.[14]

The term "cross-grouping," used as one of the measures of interdependence, refers to the practice of exchanging some or all of a teacher's students with another teacher, and receiving some or all of that teacher's students in return. "Joint teaching," on the other hand, means conducting activities or lessons with another teacher or group of teachers for a common group of students. Cross-grouping serves as an indicator of the

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[9]Scale from "very influential" (5) to "not at all influential" (1).

[10]Scale from "extremely satisfied" (5) to "not at all satisfied" (1).

[11]Ranked frequency with which class is organized in the following ways for each of three subjects: "Whole class grouped together," "two or three groups," "four or more groups," or "students work individually."

[12]Scale: "all students generally use the same materials" (1), "students are divided into four or more groups, each group using different materials" (3), "each student uses different materials" (4).

[13]Scale from "every day" (5) to "less than once a month" (1).

[14]Frequency students are free to choose their own activities in each subject. Scale ranges from "always" (6) to "never" (1).

frequency with which teachers divide their labor, while joint teaching indicates how frequently they work jointly without a set division of labor.

For each of the major variables, scales were formed by taking normalized averages of the relevant items. Scores were then averaged across all of the members of each team to give team-level aggregate data. This was done because the unit of analysis was the team, and not individual teachers. If aggregates had not been formed, then the responses of the members of a large team would have counted more than those of members of small teams.

A Simon-Blalock approach to causal modeling was used in analyzing the data (Blalock, 1964). In effect, this means that a series of regression analyses were used and attention was directed toward whether particular paths had positive, negative, or near-zero coefficients. This approach assumes a simple recursive system, where there can be neither reciprocal causation nor causal loops. It is a cruder form of analysis than path analysis, since it is only concerned with the presence or absence of relevant paths rather than their size, but it is also a more conservative approach. Given the questionable assumptions regarding measurement error which must be made in this study, and its crude theoretical base, a conservative approach seemed most appropriate.

IV. TEAM CONTEXT AND COLLABORATIVE RELATIONSHIPS

How might the contextual variables--open space, team autonomy, and team size--be related to the types of work arrangements adopted by teams? Previous research on teams and other groups suggests some possible relationships.

Compared to the self-contained classroom, open space areas involve an increase in both visibility and proximity to other teachers. Prior research findings suggest that proximity is associated with an increased likelihood that a relationship will be formed between those who are near to one another (Festinger, Schachter, and Back, 1950; Berscheid and Walster, 1969). Proximity may make it easier to become acquainted and to find out whether one wants to do things in common with another. If a relationship already exists, proximity may facilitate working

together, since it is easier to get together or move personnel or materials over short distances. Following this reasoning, we might expect that for those on teams, proximity (as indicated by open space) will increase the likelihood of a high degree of interdependence and communication among members.

Team autonomy may also affect working relationships within the team. In an experimental study, Bridges, Doyle, and Mahan (1968) found that when principals participated with teachers in problem-solving groups (a condition very similar to the measure of low team autonomy in the present study) decreased risk taking on the part of teachers resulted, possibly because of increased competition for respect and approval. Such increased competition, and the possibility that the principal will favor one teacher over others, may increase the likelihood that influence differences will develop among the teachers on the team. Thus, team autonomy may result in greater influence equality among members, and team dependence in increased differences in influence.

The effect of size, the final contextual variable, on team functioning is apparently an unresearched area, but quite a number of studies have explored the effects of size on other groups. The most dramatic finding is that increased size is strongly related to a reduction in the average rate of member communication or participation and an increase in its variance; as size increases a few members do most of the talking, while most talk very little (Thomas and Fink, 1963). Size, in effect, results in a centralization of the communication network, and this in turn may have implications for the relative influence of group members, as Leavitt's (1951) study of communication nets in groups shows. In other words, larger groups are more likely to be coordinated through centralized, hierarchical means.

Owing to coordination problems brought on by size, larger groups may also find it more difficult to work interdependently and may have to divide the labor or otherwise reduce their interdependence. This possibility is supported by findings that role differentiation and division into cliques is more likely in larger groups (Thomas and Fink, 1963; Hackman and Vidmar, 1970).

Summarizing these expectations in the form of informal hypotheses, we have:

1. Teams in open space areas will have more communication and a higher degree of interdependence than those in self-contained areas.
2. Autonomous teams will have less hierarchical coordination.
3. Larger teams will have less communication and less interdependence than smaller teams.

We can begin to see how reasonable these expectations are by looking at the matrix of zero order correlations shown in Table 4.

TABLE 4

Intercorrelations of Contextual and Intervening Variables

	1	2	3	4	5	6	7	8
1. Open Space		-.01	-.16	.08	-.05	.09	.03	.18
2. Autonomy			-.16	-.07	-.14	.11	-.05	-.26*
3. Size				-.28*	-.15	-.42**	-.16	.09
4. Cross-grouping					.07	.03	.11	-.04
5. Joint teaching						.33*	.06	.08
6. Communication							.14	-.10
7. Policies								.22*
8. Hierarchy								

*p< .05
**p< .01

It is evident from the table that open space has little to do with the way team members work together. Open space is unrelated to the measures of interdependence (cross-grouping and joint teaching) and to the measure of communication. Thus, the first informal hypothesis appears to be incorrect. Before throwing it out entirely, however, it should be recalled that the correlations shown in the table are for those who are

already on teams. It remains possible that open space may make teaming more likely and that teaming may serve to increase the likelihood of communication and interdependent action. However, for those already on teams, open space seems to make little or no difference in the interdependence or modes of coordination used.

The second informal hypothesis appears to be more accurate, as indicated by the negative correlation between team autonomy and hierarchy ($r = -.26$). More autonomous teams are apparently less hierarchically structured.

With respect to the third hypothesis, it is evident that size is negatively related to the amount of communication ($r = -.42$) and to both measures of interdependence ($r = -.28$ for cross-grouping and $-.15$ for joint teaching). It looks as though size makes it more difficult to communicate frequently and more difficult to work together interdependently. These findings appear despite the fact that the teams in the sample are already very small, half of them having only two members.

Since the contextual variables are practically independent (the largest correlation between them being $-.16$), the findings above are unconfounded, and the beta weights in a regression equation would be almost identical with the zero order correlations.

Table 4 may also be used to look at relationships between the degree of interdependence among team members and the modes of coordination they use. The correlations between cross-grouping and the three modes of coordination (communication, policies, hierarchy) reveal that cross-grouping is not significantly related to any of the modes. Apparently cross-grouping involves relatively little coordination cost for teamed teachers.

Joint teaching, however, is related to increased communication ($r = .33$), suggesting that it involves a greater degree of interdependence which must be coordinated by personal means (as distinct from set policies). Contrary to what one might expect, neither measure of interdependence is related to hierarchical coordination, a finding which is particularly surprising in light of the familiar finding in small group studies that groups whose members are interdependent tend to develop differentiated

power and prestige orders. This point will be discussed more fully later on.

If we look at the results of a regression analysis of the factors related to communication (Table 5), we see that both size and interdependence (as indicated by joint teaching) continue to be independently related to communication, and account for about a quarter of its variance (as seen by the value of R^2). Including other independent variables in the equation adds little or nothing (the betas were: open space = .04; cross-grouping = .04; autonomy = .07).

TABLE 5

Regression of Communication on Team Size and Joint Teaching

Dependent Variable	Independent Variables	Beta	R^2
Communication	Size	$-.37^{**}$	.25
	Joint Teaching	$.25^{*}$	

$^{*}p < .05$
$^{**}p < .01$

The findings of this section are summarized in Figure 2, where joint teaching has been taken as the primary indicator of interdependence. The negative relation between size and interdependence takes into account the negative correlation between size and cross-grouping as well as between size and joint teaching. Briefly, open space is not related to the intervening variables; teams in self-contained areas work together much like those in open space areas; increased size is related to a decrease in communication and in interdependence; increased autonomy is related to increased equality of influence on the team; interdependence is independently related to increased communication.

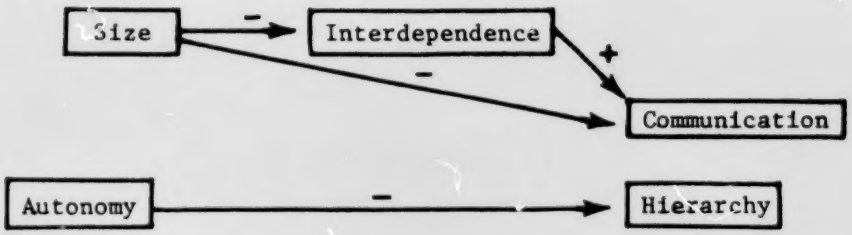

Fig. 2. Relationships of contextual and intervening variables.

V. COLLEGIAL INFLUENCE

The influence that team members can have over one another's teaching is an important indicator of the team's effectiveness in working together. The principal rationale for team teaching is that teams can work together to encourage or develop instructional activities which would be difficult for isolated teachers. When team members are unable to affect one another, the team essentially devolves to a collection of unrelated individuals, and no advantage is gained over working alone. In fact, there may be considerable disadvantage due to conflict and wasted time. Thus, a high level of collegial influence is a necessary prerequisite for an effective team.[15]

Two of the contextual variables, open space and team autonomy, seem particularly likely to affect collegial influence. It has frequently been suggested that the observability or visibility of behavior will be related to the effectiveness of influence attempts, particularly when members have not fully internalized or do not fully agree with what is requested of them (Raven and French, 1958; Collins and Guetzkow, 1964).

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[15]It is not a sufficient condition for effectiveness, however, since influence may be directed toward ends deemed to be undesirable or of low priority. Keeping this qualification in mind, influence does not seem like a bad indicator of effectiveness, particularly for groups or organizations whose technologies, or means-ends linkages, are so poorly known or difficult to control that strict output measures cannot be used.

In addition, prior studies of teaching teams have found open space (which increases visibility) to be related to increased collegial evaluation and influence (Marram, Dornbusch, and Scott, 1972; Schiller, 1972).

Autonomous teams may be able to develop higher levels of collegial influence since they can develop their own norms as well as their own leaders. When a high status outsider (e.g. the principal) supervises the group closely, controlling interaction, the influence processes among group members tend to be interrupted. The high status outsider is also likely to come with an orientation and set of concerns that differ from those independently developed by the group, thus causing some conflict over which norms or directives should be obeyed. Should members look to one another or to their informal leader, or should they look to the principal for new directives? As March (1955) has argued, the result of these conflicts under conditions of low autonomy may be a decrease in the ability of group members to influence one another, and a corresponding decrease in group effectiveness.

All of the intervening variables potentially affect collegial influence. Task interdependence has been found to be related to influence in a number of previous studies (Kahn et al., 1964; Kiesler and Kiesler, 1970). As members get more interdependent they can gain increased influence over one another because of their increased ability to reward or sanction one another by task behavior. Thus interdependence may increase the influence of members over one another by increasing the incentives available to them, although this assumes that the interdependence truly affects task accomplishment and that the tasks are valued by members.

The way team activities are coordinated may also be related to collegial influence. To the extent that team members have developed common policies, these policies may serve to legitimize influence attempts, at least within limited spheres. Increased communication may also result in increased influence, simply through the sharing of additional information. (However, this relationship may be problematic, since high rates of communication may also occur when influence attempts are not meeting with much success.) Finally, hierarchical differences

within the team may also affect influence relations, but it is not clear how. Will having extra influence during team meetings carry over into increased influence over the teaching of other members? Or will the more influential member be perceived as an illegitimate upstart, with a resultant rejection of his or her influence attempts? Given these uncertainties, it is not clear how hierarchical coordination will be related to collegial influence.

Summarizing this discussion, we have the following hypothesized relationships:

1. Teams in open space areas will have more collegial influence, compared to those in self-contained areas.
2. More autonomous teams will have more collegial influence.
3. More interdependent teams will have more collegial influence.
4. Teams with more explicit policies will have more collegial influence.
5. Teams with greater communication will have more collegial influence.

Zero order correlations between collegial influence and all of the contextual and intervening variables are shown below (Table 6). The results tend to confirm the earlier studies (the first hypothesis above) which suggested that observability (open space) affects collegial influence, since open space is correlated with collegial influence ($r = .33$). However, the other contextual variables are not significantly associated with collegial influence. Team autonomy, most notably, is not associated with collegial influence, contrary to the second informal hypothesis.

Of the intervening variables, only team policies is significantly related to collegial influence (in agreement with hypothesis 4), although the correlation between communication and influence suggests that communication may have a weak effect (hypothesis 5). Contrary to the previous argument, neither measure of interdependence is related to collegial influence (hypothesis 3). This rather surprising finding may tell us something about the nature of the interdependencies that exist between the members of teaching teams, and will be considered in more

detail in a moment. But, before considering this issue more fully, it will be useful to look at a regression analysis using the variables above.

TABLE 6

Correlations of Contextual and Intervening Variables with Collegial Influence

Variables	r
Open Space	.33**
Autonomy	.09
Cross-grouping	.01
Joint Teaching	.07
Policies	.29*
Communication	.16
Size	-.14
Hierarchy	.09

*p< .05
**p< .01

A regression of collegial influence on two contextual and two intervening variables (Table 7) reveals essentially the same pattern as the zero order correlations. Open space and team policies are both significantly related to collegial influence, but none of the other variables are.

TABLE 7

Regression of Collegial Influence on Contextual and Intervening Variables

Dependent Variable	Independent Variables	Beta	R^2
Collegial Influence	Open Space	.31**	.21
	Policies	.28*	
	Autonomy	.10	
	Communication	.09	

*p< .05
**p< .01

Small positive betas, or standardized regression coefficients, for team autonomy and communication suggest that there may be some merit to the previously hypothesized relationships between these variables and collegial influence, but if such relationships exist they appear to be very weak. Including the other variables adds little or nothing to the equation, as one would expect from the previous zero order correlations.

Influence Relations on Teaching Teams

Why is it that open space and team policies are related to collegial influence, while interdependence, team autonomy, and communication are not? What do these findings tell us about the nature of influence relations among team members?

One interpretation of the importance of open space is that observability is important in influence relations because it enables members to check up on each other and see that they do not violate agreements. This interpretation seems far too formal and officious given the small, nonhierarchical nature of most of the teaching teams in this sample. A more reasonable interpretation is derived from the fact that teaching is a highly complex, uncertain, and contingent business. The problems that each teacher faces are problems of a particular moment and situation, and are affected by a wide variety of external factors beyond the teacher's control. As a result, the most helpful suggestions or advice are likely to come from those who are familiar with all of the peculiarities of the situation. Thus teachers in open space areas, where they can see each other's classes and teaching, may feel that others' suggestions have more legitimacy.

The relationship with team policies suggests that another factor is also important--the ability of team members to agree on particular policies or approaches. Suggestions which come from a different set of value assumptions or involve a very different approach are unlikely to be accepted; but when members are able to reach explicit agreements, these agreements can serve to legitimize influence attempts.

The failure of interdependence and team autonomy to be significantly related to collegial influence also demands explanation. If the measures

of interdependence are valid, then this finding suggests that the interdependencies involved on teaching teams are often of a relatively uncritical or nonbinding nature, not affecting the central part of the teacher's task. Even in joint teaching, there may be enough "slack" to accommodate a variety of teaching methods, approaches, or even contents. This hypothesis also fits with some of the data presented earlier (Table 4), which showed little or no relationship between interdependence and hierarchical coordination on the team. Yet small group studies have rather consistently found that task interdependence is related to the development of power and prestige orders in the group. This seeming anomaly can be explained if we conclude that interdependence among teamed teachers only affects the more peripheral aspects of their tasks, or is not taken too seriously. Where interdependence is not specifically related to task performance, it provides no extra incentives which members can use to influence each other, and we might expect norms and other social influences to be more important than task contingencies. This is in fact what was found above.

Similar reasoning may explain why team autonomy is unrelated to collegial influence. If members are already relatively loosely linked with other team members, then the type of supervision by someone of higher status may have little effect on collegial influence because members just keep on doing what they did before--working largely independently.

The rather simple findings of this section are summarized in Figure 3.

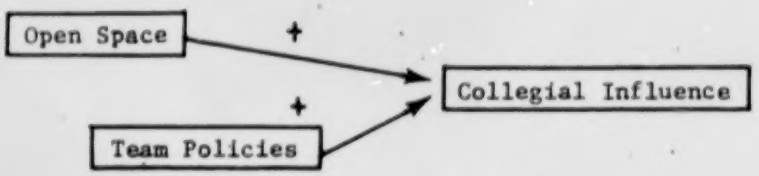

Fig. 3. Relationship of variables to collegial influence.

VI. TEAM MORALE

Over the long run the morale of team members is likely to be an important factor in the survival of a particular team. When members are dissatisfied they are likely to quit the team, or, if they cannot leave altogether, they may withdraw from common activities or greatly reduce the effort they expend in such activities. Thus, the factors affecting the morale of a teaching team may be very important to its maintenance.

Research on team morale seems to have focused largely on two factors: personality similarity and status differences. Several studies have found that teams whose members have similar personality characteristics or attitudes toward teaching have higher morale (Keith, 1970; Ables and Conway, 1973), while others have suggested that teams have higher morale when members are of equal status (Arikado and Musella, 1973), presumably because of norms of equality which hold among elementary school teachers.

No suitable measures of teacher attitudes, orientations, or personality attributes were included in the present study, so the findings on similarity cannot be replicated. However, similarity may not be so important in its own right, but rather because it enables team members to agree on appropriate procedures, and thereby reduce conflict. If so, then agreement may be the more proximate cause of increased morale. This study does contain a measure of the extent to which members have developed common policies or agreements, and we might expect this measure to be positively related to team morale.

Another factor which may be related to morale is the amount of communication among team members. If team members communicate often, they presumably have increased opportunities to participate in common decisions, thus giving them the sense of doing things together. They may also simply enjoy the pleasures of the process, i.e. enjoy interaction for its own sake. In either case, communication rates are likely to be positively related to morale.

We might also expect that teams that are more autonomous and that are supervised less closely will have higher morale. Close supervision can make power relations more visible (March and Simon, 1958) and is also likely to interrupt the usual team processes, thereby lowering morale.

Finally, in line with previous studies, we might expect teams whose members have relatively equal status and influence to have higher morale.

Summarizing these hypotheses:

1. Teams with more explicit team policies and agreements will have higher morale.
2. Teams that communicate more will have higher morale.
3. More autonomous teams will have higher morale.
4. More equal-influence (nonhierarchical) teams will have higher morale.

The zero order correlations between the contextual and intervening variables and team morale (Table 8) provide some support for the first three hypotheses. Team policies, communication, and autonomy are all significantly related to morale. However, hierarchical coordination is not significantly related to morale, casting doubt on the fourth hypothesis.

TABLE 8

Correlations of Contextual and Intervening Variables with Team Morale

Variables	r
Policies	.25*
Communication	.50**
Autonomy	.28*
Hierarchy	-.05
Joint Teaching	.20†
Cross-grouping	-.29*
Open Space	.04
Size	.04

†p< .10
*p< .05
**p< .01

Both measures of interdependence also show some relation to team morale, but in opposing directions. Joint teaching is positively related to morale (r = .20), although only at the .10 level of significance, while cross-grouping is negatively related to morale (r = -.29). Open space and team size appear to be unrelated to morale.

A regression of team morale on these variables is shown in Table 9. Most of the relationships in the regression look almost exactly like the zero order correlations. Communication continues to be strongly related to morale (beta = .52), while team policies and autonomy are also significantly related. Cross-grouping continues to have an unexpected negative relation to morale.

TABLE 9

Regression of Team Morale on Contextual and Intervening Variables

Dependent Variable	Independent Variables	Beta	R^2
Team Morale	Communication	.52**	.47
	Cross-grouping	-.27**	
	Policies	.25*	
	Autonomy	.25*	
	Size	.17	

*p< .05
**p< .01

One of the few changes from the previous zero order correlations occurs when joint teaching is added to the equation. Its addition results in only a small and insignificant beta (.06), whereas the zero order correlation was .20. This suggests that much of the relationship between joint teaching and morale was due to communication. In other words, joint teaching results in increased communication, which in turn results in higher morale. However, joint teaching is not directly related to morale.

Adding the measure of hierarchy on the team and of open space also results in little change (beta = .01 and .03, respectively). This further

confirms what seemed to be true in the zero order correlations: team hierarchy has no effect on morale, at least in this sample. This finding contradicts that of Arikado and Musella (1973), although the differences may be due to the use of different measures or to a different sample. As noted earlier, the sample used in this study consisted almost entirely of teams whose teachers reported they had no leader, and whose members in most cases reported having equal influence on the team.

The variables explaining variance in team morale, and their interrelations, are shown in Figure 4.

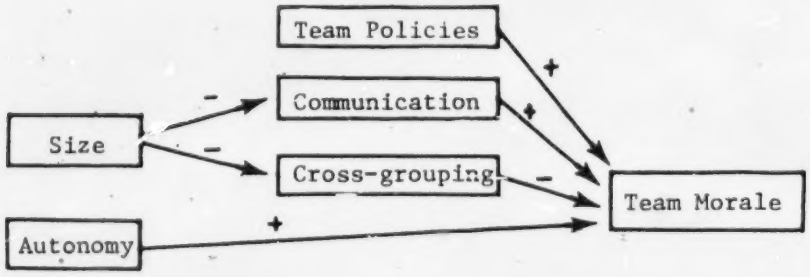

Fig. 4. Relationship of variables to team morale.

Morale on Teaching Teams

The findings of this section are the strongest in the study, accounting for nearly half of the variance in morale. They indicate that teams that communicate often, have common policies, are autonomous, and do not cross-group have the highest morale.

High communication rates may be related to morale because they increase the sense of participation, because of the sheer pleasure of talking together with others, or because they indicate that team members are still trying to work things out together and have not withdrawn from or given up on the group. Common policies indicate that team members are able to reach agreement and so have avoided potential conflicts. Common policies may also make it easier to work together, since issues do not then have to be renegotiated at every turn. Autonomous teams are likely to get on better together because there is less interruption and inhibition

and less potential competition for approval or support from the principal. Finally, a possible explanation for the cross-grouping finding is that cross-grouping may impose an undesired burden on teachers, thereby making them less satisfied with membership on the team.

VII. INSTRUCTIONAL PRACTICES

One of the reasons frequently cited for introducing team teaching and open space architecture is that they may make new instructional practices easier. Whatever effect teaming or open space may have on teachers is usually thought to be of secondary importance compared to effects on instruction and (ultimately) on students. While this study contains no data on student outcomes, it does have some information on the instructional practices teachers use, making it possible to look at relationships between teaming and instruction. However, the reader should be cautioned that this is conceptually the weakest part of the study and one in which the danger of spurious findings is great.

One may characterize the instructional practices teachers use in terms of the pattern of classroom organization. That is, rather than looking at the fine detail of student-teacher interaction (e.g., types of questioning or evaluating behavior on the part of the teacher), one can focus on global aspects of classroom organization, such as the grouping practices that are used or the amount of autonomy granted to students. This more global approach is used here, and four dimensions characterizing instructional practices are considered:

1. Grouping. Are whole class lectures most common, or are a variety of instructional groups used?
2. Materials Variation. Do different students or groups of students use different materials, or do they work with the same instructional materials?
3. Group Change. Are instructional groups relatively stable, or is there frequent change in group membership?
4. Student Autonomy. Do students have to do just what the teacher tells them to do, or can they frequently choose an activity?

These dimensions were selected in part because of their close relationship to current concerns about individualized instruction and flexible grouping.

Both teaming and open space may have an effect on these instructional practices. By making it possible to divide students among teachers in new ways, teaming may have an effect on grouping patterns within each class. For example, a teacher working alone may have too few students of a particular attainment level to create a separate group for them, but may get enough by exchanging some students with another teacher. Open space may also have an effect suggested in a study by Lueders-Salmon (1972), which found that teamed teachers in open space areas used more small groups and had more active students with more freedom of movement than non-teamed teachers in self-contained areas. Lueders-Salmon attributed some of these differences to the carpeting of open space areas, which serves to reduce noise and enables students to form groups on the floor. However, the compounding of open space and teaming in that study made it impossible to judge which, if either, was responsible for these effects. Some separation between teaming and open space is possible in the present study, since the sample contained teamed and non-teamed teachers in open space areas. Nonetheless, a complete separation is not possible because almost all of the teachers in open space areas were on teams (see Table 1).

Table 10 shows the relationships between teaming and each of the instructional variables, when controlling for open space. A nonparametric correlation coefficient (Tau) is used since teaming is a dichotomous variable.

As Table 10 indicates, teaming is positively and significantly related to all of the instructional variables in low-open-space areas. The lack of association in open space areas should not be surprising, since there is hardly any variation in the extent of teaming for teachers in open space areas.

Table 11 switches the independent and control variables around and shows the association between open space and instructional practices with teaming controlled. Open space is not related to either grouping or materials variation. However, it is negatively associated with the frequency of group change and the extent of student autonomy, perhaps because of a need to add more structure in open space areas. Again the

low correlations for those not on teams probably occur because there are hardly any teachers not on teams in open space areas.

TABLE 10

Relationship of Teaming to Instructional Practices, Controlling for Open Space+

	Tau	N
Teaming x Grouping		
High open space	.05***	47
Low open space	.20***	147
Teaming x Materials Variation		
High open space	.11***	48
Low open space	.17***	148
Teaming x Group Change		
High open space	-.09*	26
Low open space	.16*	67
Teaming x Student Autonomy		
High open space	-.07***	53
Low open space	.24***	158

+Note: Open space was dichotomized at its mean.
+Individual level data
*p< .05
**p< .001

In summary, these tables show that teaming is positively associated with all four instructional practices, while open space is negatively associated with two of them, group change and student autonomy.

A still more detailed look at the relationship between the way team members work together and their instructional practices is possible using the two indicators of interdependence, cross-grouping and joint teaching. In other words, having seen the associations with teaming,

TABLE 11

Relationship of Open Space to Instructional Practices, Controlling for Teaming+

	Tau	N
Open Space x Grouping		
Team	-.03	86
No team	-	-
Open Space x Materials Variation		
Team	.09	84
No team	.03	112
Open Space x Group Change		
Team	-.37**	44
No team	.05	49
Open Space x Student Autonomy		
Team	-.21**	91
No team	.05	120

+Individual level data
**p< .01

we can now move in to consider only those who are on teams and look at the associations with particular teaming practices (see Table 12).

TABLE 12

Correlations of Cross-grouping and Joint Teaching with Instructional Practices+

	Grouping	Materials Variation	Group Change	Student Autonomy
Cross-grouping	.14	.15	-.23	-.16
Joint Teaching	.26	.24	.64***	.16

+Team level data
***p< .001

Only one of these correlations is significant at the .05 level or better, that between joint teaching and group change (r = .64). The most interesting comparison is between the two correlations with group change, cross-grouping being negative, and joint teaching positive. This suggests that cross-grouping is more frequently used as an aid to setting up relatively stable ability groups, while joint teaching is used with more flexible grouping practices.

Factors Related to Different Instructional Practices

Teaming is evidently related to an increase in individualization and flexibility in the classroom (more change in groups, more student autonomy), while open space is related to decreased flexibility. Teaming may have an effect on instructional practices because it allows teachers to simplify the instructional task. It can allow teachers to make groups more homogeneous, specialize by subject matter, or provide another teacher to help manage the group of students. Teachers on teams may also have a larger repertoire of shared materials or learning activities on hand, thereby allowing them greater flexibility in responding to contingencies. Thus teaming may simplify the immediate teaching task[16] and increase response alternatives, both of which may facilitate a flexible, individualized form of instruction. Open space, on the other hand, may make the task more complex because there are fewer boundaries built into the situation. Teachers may compensate for this lack of external structure by imposing a tighter group structure and reducing student freedom of choice. In so doing, teachers may be attempting to simplify their tasks and bring them within manageable bounds.

It is also possible that neither teaming nor open space has any direct effect on instructional practices, since the observed correlations may be caused by some other factor or set of factors. As an example, teachers on teams may be a specially selected group whose attitudes or philosophies are different from those of teachers not on teams, and those

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[16] Although teaming may simplify the immediate task, it may also make other aspects of the teacher's job more complex, such as increasing coordination difficulties among teachers.

attitudes may be responsible for the differences in practices which were reported. While this explanation cannot be ruled out, a previous study of a different sample found virtually no differences in teacher orientations between those on teams and those teaching alone (Meyer and Cohen et al., 1971). Thus teaming may indeed facilitate the adoption of flexible, individualized instructional practices, although this should remain a tentative conclusion.

VIII. DISCUSSION AND IMPLICATIONS

The results of this study tell something about the general nature of teaching teams as well as about the specific factors explaining collegial influence, morale, and the use of differing instructional practices. In fact, the findings paint a rather consistent picture. Overall, the teaching teams in this sample appear more nearly like loose associations of similarly inclined individuals, with limited interdependence among their members, than like tightly integrated work groups.

This picture is supported by the finding that interdependence is unrelated to collegial influence or to influence differences on the team, suggesting that the interdependencies among team members are neither critical nor binding enough to affect influence relations. Interdependencies on teaching teams are not the mechanical linkages found in some industrial settings, but seem instead to be relatively unimportant aspects of the teaming relationship. More general aspects of the relationship--the willingness to talk together and share ideas and perspectives, the ability to reach agreement on common policies--appear to be more critical. The small, equal-status nature of most of the teams also reinforces a view of them as loose, voluntaristic associations.

A possible explanation for these characteristics of teams lies in the nature of the teaching task. As has frequently been pointed out, the teaching task is highly uncertain and contingent. Means-ends linkages are unclear or unknown, and many contingencies vary depending on the specific situation. As a result, it is difficult to agree on appropriate procedures and to coordinate activities. Furthermore, if teachers are really to work together closely they have to know an

enormous amount about the specific situation faced by the others, and this requires considerable time to inform and socialize one another in order to work well together.

Bearing these general characteristics of teams (in this sample) in mind, what has been learned that can be of use to the practicing administrator? The following are some tentative conclusions:

1. Small teams work together more easily than large ones. The complexity and uncertainty of the teaching task makes working together difficult. Small teams can communicate more easily and can thereby better coordinate activities and reach agreement on procedures. Teachers on small teams can also work together more closely and so really get the feel of one another's teaching styles. If teachers are to have interdependent programs, team size is an important factor to consider.

2. Autonomous teams are happy teams. The results of this study suggest that teams that are not closely supervised, have higher morale. Close supervision by the principal may serve to disrupt team problem-solving activities and increase competition for favor. This does not mean that help and encouragement by the principal will not be appreciated; however, close supervision is likely to be resented and may cause conflict within the group.

3. Teams that have common policies have higher morale and report more collegial influence. This finding suggests the usefulness of trying to formulate clear and consistent policies which everyone knows, rather than leaving everything to an ad hoc solution or leaving potentially conflictual issues unresolved. Perhaps the most important aspect of having explicit common policies is that they stabilize agreements so that members need not be continually bargaining over a fair distribution of effort or advantage. Explicit policies can thus save considerable effort and reduce potential conflict.

4. Team members in open space have more influence over each other. Perhaps because of the uniqueness of each teacher's task situation, teachers are more likely to accept influence attempts from those who work with them in areas where their work is more observable. This finding, which replicates previous studies, has implications for getting teachers to improve their teaching by accepting outside feedback and advice. Teachers will be more ready to accept such advice from colleagues who have a chance to observe their teaching in detail.

5. Teams with voluntary interdependencies are happy teams. This conclusion is admittedly highly interpretative; it is suggested by the relationship between cross-grouping and team morale. It also fits in with what appears to be the general nature of these teaching teams, in which voluntary, loose relationships seem to predominate.

6. Individualized instruction may be more easily accomplished by teams. By simplifying the teaching task through a division of labor or specialization as well as by providing additional ideas and resources which may be called upon, teaming can make it easier to increase the extent of individualization in instructional practices.

7. Open space may make non-routinized instruction more difficult. Since open space has less structure built into it, teachers may have to add more structure to the class or risk an increase in confusion.

8. Non-routine instruction is probably easier with joint teaching, although it may be necessary to increase the size of groups. If one wants to use flexible groups and give great student choice of assignment or activity, it may be easier to handle it when there are several adults around.

The overall conclusion to be drawn from this study is that teaching teams are not bureaucratic work groups and should not be treated as such. Autonomy, flexibility, and voluntarism are likely to be the hallmarks of successful teams.

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Appendix

INDICATORS OF KEY VARIABLES AND INTERCORRELATIONS OF SCALE ITEMS

1. Cross-grouping Scale

Item: For the purposes of this study, to "cross-group" students refers to the practice of sending some or all of your students to another teacher for a particular lesson, or receiving some or all of another teacher's students for your lesson(s). This might be done, for example, to allow teachers to take students who are more nearly at the same level, or to allow students to pick the activity they most want for a period, or so teachers may teach the subject(s) they prefer.

How frequently do students who are cross-grouped move between your class and another teacher's class?
(Please circle the most appropriate number in each column.)

	Math	Reading	Social Studies
Once a day	1	1	1
Several times a week	2	2	2
Once a week	3	3	3
Once or twice a month	4	4	4
Less than once a month	5	5	5
My students are not cross-grouped	6	6	6

Intercorrelations:

	Math	Reading	Social Studies	Total Scale
Math	--	.57***	.42**	.83***
Reading		--	.32*	.79***
Social Studies			--	.74***

*p < .05; **p < .01; ***p < .001

2. Joint Teaching Scale

Item: How frequently do you jointly conduct activities or lessons with another (other) teacher(s) for a common group of students?

	Math	Reading	Social Studies
At least once a day	1	1	1
Several times a week	2	2	2
Once a week	3	3	3
Once or twice a month	4	4	4
Less than once a month	5	5	5
Never	6	6	6

Intercorrelations:

	Math	Reading	Social Studies	Total Scale
Math	--	.73***	.43***	.85***
Reading		--	.56***	.90***
Social Studies			--	.79***

***p < .001

3. Team Policies Scale

Item: To what degree would you say your team has developed rather explicit team policies or agreements affecting... (Please circle the most appropriate number in each row.)

	A Great Deal	Considerable	Moderate	A Little	None	NA
Instructional methods	1	2	3	4	5	0
†Lesson content and materials to be taught	1	2	3	4	5	0
Standards of student control and discipline	1	2	3	4	5	0
The way students are to be grouped and moved	1	2	3	4	5	0
The schedule of subjects and activities	1	2	3	4	5	0

Intercorrelations:

	Methods	Content	Control	Grouping	Schedules	Total Scale
Methods	--	.47***	.22	.18	.11	.53***
†Content		--	.04	.10	.10	.26
Control			--	.29*	.43**	.72***
Grouping				--	.68***	.78***
Schedules					--	.80***

†Item excluded from scale. *p < .05; **p < .01; ***p < .001

4. Collegial Influence Scale

Item: How influential are other members of your team on...

	Extremely Influ-ential	Very Influ-ential	Moderately Influ-ential	Slightly Influ-ential	Not at all Influ-ential	NA
The instructional methods you use	1	2	3	4	5	0
The lesson content and materials you use	1	2	3	4	5	0
The standards of student discipline and control you use	1	2	3	4	5	0
+The way you group and move students	1	2	3	4	5	0
The schedule of lessons and activities you follow	1	2	3	4	5	0

Intercorrelations:

	Methods	Content	Control	Grouping	Schedules	Total Scale
Methods	--	.51***	.49***	.02	.46***	.84***
Content		--	.15	-.08	.32*	.67***
Control			--	.28*	.45***	.70***
+Grouping				--	.33*	.23
Schedules					--	.75***

+Item excluded from scale. *p < .05; ***p < .001

5. Team Morale Scale

Item: How satisfied are you with your team in each of the following areas?

	Extremely Satisfied	Very Satisfied	Moderately Satisfied	Slightly Satisfied	Not at All Satisfied
The extent to which resources are shared	1	2	3	4	5
Openness in commenting on each other's teaching	1	2	3	4	5
Ability to plan together effectively	1	2	3	4	5
Flexibility in scheduling classes and activities	1	2	3	4	5

Intercorrelations:

	Resources	Commenting	Planning	Scheduling	Total Scale
Resources	--	.70***	.71***	.75***	.90***
Commenting		--	.64***	.59***	.83***
Planning			--	.81***	.90***
Scheduling				--	.90***

***p < .001

6. Instructional Practices

A. Grouping

Item: Please rank the following four categories for each subject, to show which way your students are organized most frequently (rank = 1), second most frequently (rank = 2), and so forth.

	Math Rank	Reading Rank	Social Studies Rank
Whole class grouped together	____	____	____
Two or three groups	____	____	____
Four or more groups	____	____	____
Students work individually	____	____	____

B. Materials Variation

Item: In general, how much variation is there in the materials your students use in each subject? (Check the most accurate answer.)

	Math	Reading	Social Studies
All students generally use the same materials	1	1	1
Students are divided into two or three groups, each group using different materials	2	2	2
Students are divided into four or more groups, each group using different materials	3	3	3
Each student uses different materials	4	4	4

C. Group Change

Item: If your class is sometimes broken into groups for a subject, how often would you say the membership of groups changes?

	Math	Reading	Social Studies
Every day	1	1	1
Several times a week	2	2	2
Once a week	3	3	3
Once or twice a month	4	4	4
Less than once a month	5	5	5
I rarely break the class into groups	0	0	0

D. Student Autonomy

Item: How often are students in your class(es) free to choose their own activities in each subject?

	Math	Reading	Social Studies
Always	1	1	1
Usually	2	2	2
Fairly often	3	3	3
Occasionally	4	4	4
Seldom	5	5	5
Never	6	6	6

7. Communication

Item: How frequently does your team hold regular or impromptu meetings?

___ 1. Several times a day
___ 2. Once a day
___ 3. Several times a week
___ 4. Once a week
___ 5. Once or twice a month
___ 6. Less than once a month

8. Open Space

Item: In which type of classroom space do you usually teach? (Check one.)

___ 1. Open space
___ 2. Classrooms separated by movable partitions--which are open most of the time
___ 3. Classrooms separated by movable partitions--which are closed most of the time
___ 4. Self-contained classroom
___ 5. Other, please specify _____

9. Team Autonomy

Item: How frequently does your principal sit in on your team meetings?

___ 1. Always
___ 2. Usually
___ 3. Fairly often
___ 4. Occasionally
___ 5. Seldom
___ 6. Almost never or never